

Claims

What is claimed is:

1. A method comprising steps of:
  - (a) assigning a unique tag for each of several disc access commands; and
  - 5 (b) designating which of a plurality of queue execution modes to use for a selected one of the disc access commands based on the selected command's tag.
2. The method of claim 1, further comprising steps of:
  - 10 (c) associating at least two of the disc access commands with only one of the queue execution modes; and
  - (d) executing the two commands in an order that is partially based on an estimated seek length for each of the two commands.
3. The method of claim 1, further comprising a step of establishing a contiguous  
15 range of tags that includes the selected command's tag, the contiguous range corresponding to the mode to be designated in the designating step (b).
4. The method of claim 1, further comprising steps of:
  - (c) holding a sector identifier of the disc access command in a task file register; and
  - 20 (d) transferring a data block corresponding to the sector identifier through a transducer adjacent to a data storage disc.
5. The method of claim 1, further comprising steps of:
  - (c) associating one of the queue execution modes with a first queue;
  - 25 (d) associating another of the queue execution modes with a second queue; and
  - (e) performing an operation that affects at least one command in the first queue without affecting a command that is in the second queue.

6. The method of claim 1, further comprising a step (c) of determining whether to abort any of the pending disc access commands based on a newly-received command.
- 5 7. The method of claim 1, further comprising a step (c) of redefining a queue execution mode that is associated with at least one tag while the at least one tag is not assigned to any disc access command.
8. The method of claim 1 in which the designating step (b) includes a step (b1) of  
10 determining which of a plurality of error correction modes to use for the selected disc access command.
9. The method of claim 1, further comprising a step (c) of using at least one of the  
15 queue execution modes to transfer video data through a transducer adjacent to a data storage disc.
10. The method of claim 9 in which the designating step (b) includes a step (b1) of  
20 determining whether to use a sequential delivery mode for the selected disc access command.
11. The method of claim 1 in which the designating step (b) includes a step (b1) of  
determining whether to use a sequential delivery mode for the selected disc  
access command.
- 25 12. The method of claim 1 in which a triggered operation is performed on an in-store one of the commands if an in-progress one of the commands is associated with a predetermined trigger tag, and otherwise the triggered operation is generally not performed on the in-store command.

13. The method of claim 1 in which the designating step (b) includes a step (b1) of establishing the designated queue execution mode so that an error is reported if the selected command is not completed within a predetermined interval, and otherwise the error is generally not reported.
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14. The method of claim 1 in which the assigning step (a) comprises steps of:
- (a1) assigning a first one of the tags to a first-received one of the commands;
- (a2) while the received command is still pending, assigning a second one of the tags to a second-received one of the commands;
- 10 (a3) while the received commands are both still pending, assigning a third one of the tags to a third-received one of the commands; and
- (a4) after the assigning steps (a1) - (a3) are completed, completing the first-, second- and third-received commands.
- 15 15. The method of claim 14 in which the assigning step (a) further comprises a step (a5) of assigning a fourth one of the tags to a fourth-received one of the commands while the third-received command is still pending.

16. A method comprising steps of:
- (a) defining an available set of modes to comprise a standard mode and a video mode, the standard mode associated with a standard queue and configured to use a standard error correction process, the video mode associated with a non-standard queue and not configured to use the standard error correction process;
  - (b) assigning a sequential delivery queue tag to a first-received one of the commands, the first-received command being a video data transfer command;
  - (c) assigning a first standard queue tag to a second-received one of the commands while the received command is still pending, the second-received command being a standard read command;
  - (d) assigning a second standard queue tag to a third-received one of the commands while the received commands are both still pending, the third-received command being a standard write command;
  - (e) assigning another tag to a fourth-received one of the commands while the third-received command is still pending;
  - (f) designating one of the available set of modes for each of the commands based on the command's tag; and
  - (g) after the assigning steps (b)-(e) and the designating step (f) are completed, completing the received commands.
17. The method of claim 16 in which the completing step (g) is performed by steps comprising:
- (g1) using the video mode to transfer data through a transducer at a disc location identified by the sector address associated with the first-received command; and
  - (g2) using the standard mode and the sector addresses associated with the standard commands, executing the standard commands in a sequence that is partially based on an estimated seek length for each of the standard commands.

18. An electromechanical device comprising:  
one or more data storage disc(s);  
a memory configured to hold several pending commands for accessing the  
disc(s), each of the commands having a unique tag; and  
5 a controller configured to determine which of a plurality of queue execution  
modes to use for a selected one of the pending disc access commands based on  
the selected command's tag.
19. The electromechanical device of claim 18 in which the memory is configured to  
10 hold the tag as a binary value no larger than one byte.
20. The electromechanical device of claim 18, further including an actuator having a  
nominal seek time longer than 1 millisecond
- 15 21. The electromechanical device of claim 18 in which the memory includes a  
multiple-bit state register configured to identify one or more other tags that are  
available for a future command.
22. The electromechanical device of claim 18 in which the queue execution modes  
20 include a higher-priority mode associated with a first queue and a lower-priority  
mode associated with a second queue.
23. The electromechanical device of claim 22 in which the first queue is associated  
with a total of M tags, in which the second mode is associated with a total of N  
25 tags, and in which  $N > 0$  and  $M > 0$ .
24. The electromechanical device of claim 18 in which the controller is operatively  
coupled to communicate with a host through a serial ATA bus.